

FIG. 1
CONVENTIONAL ART

16 LEVEL($2^4=4\text{bits}$) QUANTIZATION OF UNIFORM QUANTIZATION

BINARY NOTATION OF QUANTUM VALVE	QUANTUM VALVE	QUANTIZATION SECTION
0000	0	0.0000 ~ 0.0624
0001	$1/15=0.0667$	0.0625 ~ 0.1249
0010	$2/15$	0.1250 ~ 0.1874
0011	$3/15$	0.1875 ~ 0.2499
0100	$4/15$	0.2500 ~ 0.3124
0101	$5/15$	0.3125 ~ 0.3749
0110	$6/15$	0.3750 ~ 0.4374
0111	$7/15$	0.4375 ~ 0.4999
1000	$8/15$	0.5000 ~ 0.5624
1001	$9/15$	0.5625 ~ 0.6249
1010	$10/15$	0.6250 ~ 0.6874
1011	$11/15$	0.6875 ~ 0.7499
1100	$12/15$	0.7500 ~ 0.8124
1101	$13/15$	0.8125 ~ 0.8749
1110	$14/15$	0.8750 ~ 0.9374
1111	1	0.9375 ~ 1.0000

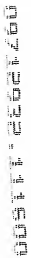


FIG. 3

16 LEVEL($2^4=4\text{bits}$) QUANTIZATION OF UNIFORM QUANTIZATION

BINARY NOTATION OF QUANTUM VALVE	QUANTUM VALVE	QUANTIZATION SECTION
0000	0	0
0001	$1/15=0.0667$	$0.0001 \sim 0.0071$
0010	$2/15$	$0.0072 \sim 0.0142$
0011	$3/15$	$0.0144 \sim 0.0214$
0100	$4/15$	$0.0215 \sim 0.0285$
0101	$5/15$	$0.0286 \sim 0.0356$
0110	$6/15$	$0.0357 \sim 0.0428$
0111	$7/15$	$0.0429 \sim 0.0499$
1000	$8/15$	$0.0500 \sim 0.0570$
1001	$9/15$	$0.0571 \sim 0.0642$
1010	$10/15$	$0.0643 \sim 0.0713$
1011	$11/15$	$0.0714 \sim 0.0784$
1100	$12/15$	$0.0785 \sim 0.0855$
1101	$13/15$	$0.0856 \sim 0.0927$
1110	$14/15$	$0.0928 \sim 0.0999$
1111	1	$0.1000 \sim 1.0000$

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